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RANGELAND/LIVESTOCK MANAGEMENT EFFECTS REPORT

Medicine Bow Landscape Vegetation Analysis (LaVA) Project

Medicine Bow National Forest

Albany and Carbon Counties, Wyoming

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Reviewed for cumulative effects on 07/13/2020 in response to the June 10, 2020 Objection Instructions. No changes were made.

TABLE OF CONTENTS

Summary **1**

Forest Plan Direction **1**

Revised Land and Resource Management Plan for the Medicine Bow National Forest (USDA Forest Service 2003) 1

Environmental Consequences **1**

Alternative 1 - No Action 1

Brief Description of the No Action Alternative 1

Direct and Indirect Effects of the No Action Alternative 2

Alternative 2 – Modified Proposed Action 4

Brief Description of the Modified Proposed Action 4

Comparing Magnitude of Effects by Accounting Unit 6

Direct and Indirect Effects of the Modified Proposed Action 7

Cumulative Effects 10

Cumulative Effects upon Livestock Producers 10

Cumulative Effects – No Action Alternative 11

Cumulative Effects – Modified Proposed Action 11

References **12**

SUMMARY

This report discusses the effects of a proposed landscape scale vegetation management project upon livestock management and rangeland health and productivity on the Snowy Range and Sierra Madre mountain ranges within the Brush Creek/Hayden (BCH) and Laramie Ranger Districts of the Medicine Bow National Forest. It also discusses the effects of the No Action alternative. This proposed project would authorize vegetation management activities for the next 10-15 years and could authorize up to 95,000 acres of stand initiating or even-aged forest treatment methods, up to 165,000 acres of uneven-aged or intermediate forest treatments and up to 100,000 acres of other vegetation treatments such as prescribed fire, mastication and hand-thinning in forested and non-forested areas. This project has potential to affect 45 active grazing allotments and 35 livestock grazing permittees.

FOREST PLAN DIRECTION

Revised Land and Resource Management Plan for the Medicine Bow National Forest (USDA Forest Service 2003)

Continue to satisfy the demand for livestock products through grazing management that is economic, environmentally sound, and compatible with other resources.

Maintain current levels of grazing opportunities on suitable rangelands to achieve desired conditions.

Rangeland vegetation will include a mix of seral stages across the landscape. Approximately 10-20% of the vegetation will be in early seral, 60-80% will be in mid seral, and 10-20% in late seral stages. This desired mix of seral stages is to be evaluated at the Geographic Area scale. Noxious weed populations are being identified and mapped with the primary emphasis in preventing new noxious weed infestations while aggressively pursuing control and eradication of existing populations.

In fire and harvest created openings, manage livestock grazing to assure management does not prevent successful regeneration of shrubs and trees.

In aspen stands, manage livestock grazing to ensure impacts do not prevent or inhibit sprout survival sufficient to perpetuate the long-term viability of the clones.

For all proposed projects or activities, determine the risk of noxious weed introduction or spread and implement appropriate mitigation measures.

ENVIRONMENTAL CONSEQUENCES

Alternative 1 - No Action

Brief Description of the No Action Alternative

The No Action Alternative assumes that the Modified Proposed Action would not be implemented. Other vegetation and fuels management projects (such as timber sales; tree thinning; watershed and wildlife habitat restoration; and fuels reduction) would be expected to proceed under the No Action

Alternative, authorized under separate NEPA analyses or authorities. Cumulatively, these projects would not treat as many acres of land within the time frame anticipated for the proposed action but would continue at similar levels to those that have occurred since the Medicine Bow National Forest Revised Land and Resource Management Plan was approved in 2003. It is estimated that an average of about 5,067 acres per year would be treated and about 5 miles of temporary road might be constructed per year. Over a 15 year period (equivalent to the time frame for the proposed action) it is estimated there would be about 76,005 acres treated and about 75 miles of temporary road constructed under the No Action Alternative. That contrasts sharply with a possible maximum of 360,000 acres of treated vegetation and up to 600 miles of temporary road constructed over the life of the Modified Proposed Action. A more detailed description of the No Action Alternative is included in the Final Environmental Impact Statement for this project.

Direct and Indirect Effects of the No Action Alternative

Livestock Management

Term permitted grazing use would continue as currently authorized in most cases. There would not likely be a change in permitted livestock grazing under the No Action Alternative unless temporary adjustments were needed to respond to events such as wildfire; chronic livestock management issues; loss of access to grazing areas due to heavy downfall timber; or to stock vacant allotments. Livestock management will continue as prescribed in Allotment Management Plans in most areas. However, if downfall timber restricts access to sizable primary grazing areas this could eventually require temporary adjustments to the grazing season, grazing rotation or livestock numbers on some allotments until access to primary grazing areas is restored through wildfire, cutting of stock trails through downfall timber or through timber removal projects that are expected to continue under the No Action Alternative. Range structures would be maintained and improved as necessary to continue livestock management at its current scope and intensity. Some grazing allotment management plan revision may occur, where necessary, after completion of appropriate NEPA analyses unrelated to this project proposal.

Noise, human activity and vehicle traffic associated with implementation of program and project work likely to occur under the No Action Alternative may temporarily influence livestock distribution and make livestock management temporarily more difficult in some locations. It will occur on fewer acres in and be spread over a longer span of years than what would occur under the Modified Proposed Action, so may be less of an impact to permittees than would implementation of the proposed action.

Maintenance of range improvements (fences and watering facilities) and livestock management (moving and gathering livestock) will continue to present increased level of difficulty and danger for permittees relative to what was historically the case. This is due to the unprecedented scope and scale of tree die-off created by the mountain pine beetle epidemic. These dangerous conditions are likely to persist for decades until a majority of dead trees have fallen, been removed by wildfire, or have been harvested under smaller scale projects that are likely to be implemented under the No Action Alternative. Even after wildfire, the danger of falling trees remains, since many fires leave standing dead trees. Because of the increased difficulty in locating and moving livestock in the post beetle epidemic landscape, there is an increased risk of loss of livestock in the event of a wildfire.

Natural barriers created by contiguous stands of mature coniferous forest with little or no understory forage usually work in combination with constructed fences to keep cattle within allotments or pastures; but this is changing as the mountain pine beetle forest deteriorates. In some cases, fallen trees restore or maintain effective barriers in dead pine stands. In other locations, cattle may cross dead pine stands because the newly available forage attracts them, and the natural barriers are gone. Ineffective natural

barriers means livestock managers may have to spend more time managing their cattle or contribute to the construction of additional fences to restore the integrity of pastures or allotments. The maintenance of new fences generally falls to the benefitting permittee.

With the current condition of forest stands affected by the mountain pine beetle, the Forest Service is now quite limited in the suppression tactics it can employ in the event of a wildfire. It is not safe to stage fire-fighters in areas of heavy downfall and standing dead timber, and it takes longer to prepare effective firelines in such stands. Because of our more limited fire-fighting options, some fires may not be containable until they reach significant contiguous changes in fuels such as grasslands or shrublands at or beyond the Forest Boundary, major highways, or major watercourses. Some fires may therefore grow larger before they can be contained than they would have before the beetle epidemic. This translates to more potential for loss of livestock to fire, damage to structural improvements, and temporary loss of livestock forage.

Because of the elevated hazard and difficulty of maintaining range improvements and managing cattle in the current landscape of dead and falling trees and the relatively small number of acres of such vegetation that would be treated, the No Action alternative is likely to be more detrimental to livestock management and livestock producers than the modified proposed action.

Rangeland Health and Productivity

Coniferous forest that experienced high tree mortality from the mountain pine beetle epidemic and other insect and disease agents in recent years will continue to provide some increase in forage for livestock now that more sunlight penetrates these stands; but in many areas livestock access to this forage will decrease or has already decreased as trees continue to fall. Before the mountain pine beetle epidemic most of these forest stands provided little or no forage for livestock because the herbaceous understory was sparse or was dominated by plants such as grouse whortleberry, pinegrass or elk sedge which have low palatability and forage value for livestock. Now that more sunshine reaches the forest floor and trees no longer compete for moisture, the herbaceous understory has increased in diversity and productivity on many sites. Vegetation, fuels, wildlife, and watershed projects that would be expected to proceed under the No Action alternative would also provide some increased transitory range for livestock wherever they result in decreased forest or shrubland canopy but the acreage would be much less than under the Modified Proposed Action.

Many aspen stands within the project area are old and are transitioning to coniferous forest stands through natural succession. Shade-tolerant subalpine fir and spruce trees find favorable growing conditions in aspen stands and eventually grow tall enough to shade out aspen and achieve dominance. Early to mid-seral aspen stands usually provide much more forage for livestock and wildlife than late seral aspen stands with a heavy conifer component. Some aspen treatments will proceed under the NO Action Alternative either by mechanical means or through use of prescribed fire, or both, but natural succession will continue to gradually reduce forage resources for livestock in many aspen stands. Wildfire would be another disturbance that could convert late and mid seral aspen stands to early seral stands under the No Action Alternative.

Aging shrub/grass stands that are, or are becoming, dense and decadent (greater than 50% of the shrub canopy dead) will continue to provide less forage for livestock than they did at earlier seral stages. Forage production may decrease further over time on some sites in the absence of natural events which thin or remove the old shrub canopy. Conversion of old, late seral shrub stands to earlier seral stages can result naturally from insect and disease outbreaks, extreme weather events, prolonged heavy browsing or wildfire. Shrubland treatments that are expected to occur under the No Action Alternative will create additional early and mid seral shrublands with high forage production, but the number of acres treated will be less than what would occur under the Modified Proposed Action.

Though wildfire is one of the most common natural forces that creates diversity of seral stages/age classes in shrubland plant communities it is unpredictable in timing and extent and may burn larger contiguous areas of shrublands than is desirable for wildlife habitat or rangeland health. A relatively fine mosaic of burned and unburned patches such as is achievable by prescribed fire often provides better wildlife habitat and promotes faster shrub regeneration. Wildfires may also burn so hot that organic matter is consumed and erosion follows. In this event, re-establishment of young shrubs and a productive herbaceous plant community that provides good quality and quantity of livestock forage could take years. Wildfires, particularly within the past decade, have increased invasive species such as cheatgrass in some locations. Cheatgrass out-competes much more productive and palatable forage grasses and therefore decreases forage production where it becomes the dominant or co-dominant grass.

As discussed above relative to livestock management, the current condition of our forests has changed the way the Forest Service can safely and effectively fight wildfires. Under these conditions we may see some fires grow larger than they would have in the pre-bark beetle era. It is possible there will be more acres of rangeland affected by wildfire than there were before the beetle epidemic. Where these wildfires are intense, soil organic matter may be consumed and recovery of rangeland productivity may take years.

Alternative 2 – Modified Proposed Action

Brief Description of the Modified Proposed Action

The Forest Service proposes to conduct vegetation management activities on NFS lands, including inventoried roadless areas, within the Sierra Madre and Snowy Range Mountain Ranges of the MBNF. Vegetation management activities, including prescribed fire, mechanical, and hand treatment methods, could be applied on up to 360,000 acres to make areas more resilient to future disturbance; protect, restore, and enhance forest ecosystem components; supply forest products to local industries; provide for human safety; reduce wildfire risk to communities, infrastructure, and municipal water supplies; and improve, protect, and restore wildlife habitat. Specific treatments would be developed and authorized for implementation over a 10-year period beginning in 2019 and would be completed within approximately 15 years of the project decision. A combination of commercial timber sales, service contracts, stewardship contracts, cooperative authorities, partner capacity, and Forest Service crews would be used to implement the project.

The Modified Proposed Action is intended to address continually changing forest conditions by incorporating principles of adaptive management. In doing so, this alternative proposes an acreage ceiling of up to 360,000 acres that could be treated within pre-established Treatment Opportunity Areas (613,110 acres) rather than identifying site-specific treatment units. During project implementation, the Forest Service would cooperate with other agencies, local governments, interested stakeholders, and organizations to identify specific treatment units. Specific objectives of each treatment unit would be determined prior to any ground-disturbing activities using existing vegetation conditions and a series of project-developed field review forms. The sum of all treatments, regardless of roadless status, would not exceed 360,000 acres and would be dependent on such things as staffing, funding, site-specific resource conditions, and project design features.

Specific activities associated with the Modified Proposed Action include:

- Up to 95,000 acres of stand initiating or even-aged treatment methods.
- Up to 165,000 acres of uneven-aged or intermediate treatments.

- Up to 100,000 acres of other vegetation treatments, including prescribed fire, mastication, and hand thinning.
- Constructing not more than 600 miles of temporary road, as necessary, to access treatment areas.

Adaptive Management Treatment Options

A variety of management options including, but not limited to, clearcutting/coppice; group and individual tree selection; salvage; mastication; sanitation; thinning; and prescribed fire would be used to achieve resource objectives identified for individual treatments.

Inventoried Roadless Areas

Roughly 123,000 acres of Inventoried Roadless Areas (IRAs) have been identified as potential Treatment Opportunity Areas (TOAs). No temporary road construction would occur in IRAs.

Road/Access Information

The Modified Proposed Action includes constructing no more than 600 miles of temporary road, as necessary, to access treatment areas. Temporary roads would be for administrative use only (i.e., they would be managed as closed to the public) and would be reclaimed within 3 years of project completion preclude future motorized use and to restore ecological function in the affected area. Methods for reclaiming temporary roads may include, but are not limited to, re-contouring the road, ripping/scarifying the roadbed, removing culverts, installing drainage features, creating physical barriers to preclude motorized travel, scattering wood/rock debris onto the road, applying seed and mulch to the area, and posting signs.

The alternative also includes utilizing and/or reconstructing existing open and closed NFS roads to access treatment units. Reconstruction may include road blading, culvert installation or replacement, and gravelling. Closed NFS roads would be for administrative access only and would be returned to a closed status with the method of closure being determined at implementation.

Other Activities

Other activities associated with the Modified Proposed Action include, but are not limited to slash treatments (e.g., pile burning, chipping), regeneration surveys, noxious weed control, native grass/forb seeding, and road maintenance associated with implementing vegetation treatments.

Project Design Features and Analysis Assumptions

Project Design Features (PDFs) and Analysis Assumptions have already been developed for the LaVA Project to reduce or prevent potential undesirable effects resulting from management activities and to ensure consistent analysis of project effects, respectively. Project Design Features were developed using guidance from such documents as the State of Wyoming Best Management Practices, Watershed Conservation Practices, Revised Land and Resource Management Plan for the Medicine Bow National Forest (Forest Plan) standards and guidelines, and other environmental protections required by applicable laws, regulations, and policies. The PDFs and Analysis Assumptions specific to the LaVA project are included in the project files.

The following modifications have been made to the Proposed Action to address concerns raised during the July 2017 scoping effort:

- Eliminating the 10 miles of permanent road construction proposed in the July 2017 Scoping Document.

- Developing a new TOA map to better reflect where temporary road construction is and is not allowed, per Forest Plan direction.

A more detailed description of the Modified Proposed Action is included in the Final Environmental Impact Statement for this project.

Comparing Magnitude of Effects by Accounting Unit

The project area was divided into accounting units (AUs) to facilitate effects analyses, decision making, and project implementation, particularly for wildlife and hydrologic resource areas. For rangeland resources, however, a meaningful effects comparison cannot be made among these accounting units for several reasons:

- Many allotments cross accounting unit boundaries, so the number of acres of proposed treatments within an accounting unit does not equate to the magnitude of effects upon a particular grazing allotment or permittee.
- The positive effects of fenceline clearing will depend upon where timber harvest/salvage units are ultimately located within the TOAs.
- The negative effects of loss of natural barriers between pastures and/or allotments will depend upon where timber harvest/salvage units are ultimately located within the TOAs.
- Most of the proposed treatments have both negative and positive consequences for permittees which may cancel each other out in some instances. For example, tree removal along allotment and pasture boundaries will free fenced boundaries from accelerated damage due to treefall, but will make some unfenced boundaries less effective or ineffective.

The table below provides some metrics regarding the number of grazing allotments, miles of fences and natural barriers as well as acres of aspen forest and upland shrublands, grasslands and forblands within Treatment Opportunity Areas (TOAs) by accounting unit to illustrate differences among them. The Sandy Battle Accounting Unit contains the most miles of fence and acres of aspen and upland shrublands, grasslands and forblands within accounting units, followed by the Big Blackhall and Jack Savery accounting units. The Jack Savery Accounting Unit has the most miles of natural barrier within Treatment Opportunity Areas. These metrics indicate where there is more opportunity to impact livestock grazing management and forage resources for livestock (either positively or negatively), but they do not indicate anticipated levels of impact to allotments and permittees within these accounting units. Those impacts will be dependent upon the actual location and acreages of treatment units, as well as their distribution over the 15 year time frame of the modified proposed action.

Table 1. Rangeland and Livestock Related Parameters by Accounting Unit

Accounting Unit	Number of Grazing Allotments within Accounting Units	Approximate Miles of Fence within or adjacent to TOAs (includes fences against BLM, PVT and STE land)	Approximate Miles of Natural Barriers between pastures and allotments within TOAs	Approximate Acres of Aspen Forest within TOAs	Approximate Acres of uplands dominated by some mix of shrubs, grasses and forbs within TOAs (this total excludes wet meadows, riparian areas, temporary grasslands created by timber harvest or fire, and alpine grasslands)
Battle Pass	5 partial	10.74	3.1	2,353	2,064
Rock Morgan	1 entire, 2 partial	7.8	10.6	409	1,769
Owen Sheep	1 entire, 2 partial	0.6	0	572	9,503
North Corner	3 partial	4.9	10.7	872	2,188
French Douglas	3 entire, 5 partial	5.9	13.6	679	1,398
Fox Wood	1 entire, 4 partial	15.0	10.0	1,723	9,714
Bow Kettle	2 entire, 2 partial	15.75	13.9	2,803	2,026
West French	2 entire, 3 partial	19.57	3.3	2,449	3,398
Cedar Brush	4 entire, 2 partial	22.77	12.8	2,629	4,129
Pelton Platte	1 entire, 4 partial	11.13	1.7	828	4,363
Big Blackhall	1 entire, 2 partial	41.23	6.6	2,571	10,049
Green Hog	3 entire, 2 partial	11.17	2.7	5,598	4,239
Jack Savery	2 entire, 2 partial	40.76	22.3	5,979	11,720
Sandy Battle	10 entire, 4 partial	122.74	1.2	25,554	28,018

Direct and Indirect Effects of the Modified Proposed Action

Livestock Management

Timber harvest will produce transitory livestock forage (forage that will be available for a limited number of years) that could last 15 years or more, depending upon the site characteristics. The amount, availability and palatability of forage on transitory rangelands will vary by site and be influenced by

proximity of water, the amount of residual slash, and herbaceous plant species composition. The Modified Proposed Action could create up to 260,000 acres of mature timber treatments, with up to 95,000 acres of that being even-aged harvest (clear-cutting and overstory removal); while under the No Action Alternative there would likely be no more than than 20,000 total acres of mature timber harvested over the same 15 year period In locations where large amounts of transitory range are created and damage to coniferous tree seedlings is not a concern, temporary increases in stocking could be granted in some circumstances.

Large scale removal of standing dead coniferous timber across up to 260,000 acres of forest as proposed will greatly reduce the risk of injury to livestock managers while maintaining structural improvements and managing cattle on their allotments. It will be much easier for many of the permittees within the project area to locate, gather and move livestock after this timber is removed, provided the slash is not too deep or widespread to move cattle through harvest/salvage units

Cattle browsing on young coniferous trees in harvest units is infrequent on the BCH and Laramie districts. Cattle generally do not browse young trees until they have already exceeded maximum use levels on herbaceous forage; so proper livestock management as prescribed in allotment management plans and the Forest Plan will allow use of transitory forage in timber harvest units without damaging tree regeneration in most instances. Domestic sheep are more inclined to browse on young trees at various times through the grazing season depending on what alternative forage is available and management practices used by the herder. Transitory range in timber harvest units within sheep allotments may be less available than in cattle allotments if browsing of seedling coniferous trees by sheep is found to occur at a level that would hinder successful reforestation. Trampling of regenerating trees in harvested timber stands is also a consideration for both sheep and cattle, and will influence how much the use of transitory range is to be encouraged on a case by case basis.

Noise and activity associated with timber harvest may temporarily cause livestock to avoid those areas, changing their distribution patterns within pastures or allotments. This may require more management of the livestock to maintain satisfactory distribution and to prevent overuse of areas more remote from the logging activity. This is a relatively short-lived effect and will vary by concentration of vegetation management activities, the locations of primary grazing areas relative to treatment areas, and the nature of the livestock. However, due to the broad geographic scope and large number of treatment acres proposed over a relatively compressed timeframe, the disturbance may be more widespread than would be the case for similar projects expected to be implemented under the No Action Alternative.

Increased log truck and worker traffic may temporarily make it more difficult for permittees to use some roads for trailing livestock and will increase livestock collision hazard to some degree during timber harvest and log hauling. The level of road traffic under the modified proposed action is likely to be much greater (occurring in more areas and over longer periods of time) than it would have been for similar types of timber harvest projects implemented under the No Action Alternative due to the scale of this proposal. Permittee access will be improved on many more acres and over a shorter period of time than would be the case under the NO Action Alternative. The Modified Proposed Action includes a design criteria that requires selection of treatment locations be coordinated with Forest rangeland management specialists so as to limit negative impacts to allotment management and permittee operations. The rangeland manager will consult with affected permittees as part of this process. The Modified Proposed Action also includes Adaptive Implementation and Monitoring Framework that provides opportunity for input from permittees and other members of the public as well as agencies such as Conservation Districts and the Wyoming Department of Agriculture before treatment areas are finalized.

Removal of dead trees through harvest or prescribed fire will prolong the life of some fences and maintain or restore access to some watering facilities. It will also reduce maintenance time and expense

for permittees. Some damage to fences or dismantling of fence segments can be expected during timber harvest operations when a harvest unit straddles fence. Range infrastructure within harvest units will be identified in timber sale contracts as sites to be protected from damage, and would therefore be repaired by the timber operator if damage did occur during the harvest process. Prescribed fire would also be implemented so as to protect fences and spring developments. Because of the scale of this project, more miles of fence and watering facilities are likely to be freed from accelerated damage or access difficulties than would be the case under the NO Action alternative.

There are currently many miles of timber stands which serve as natural barrier for either allotment or pasture boundaries. Harvest in timber stands which presently serve as natural barriers may create breaches in those barriers. This may require more riding by permittees to keep cattle in authorized locations or may necessitate construction of additional fence. Any new fences would be constructed according to the terms of the grazing permit (generally cost-shared between affected the permittees and the Forest Service) and would be subject to analysis required by the National Environmental Policy Act. It is expected that more miles of natural barrier will be removed under the Modified Proposed Action than would occur under the No Action Alternative and it will likely happen over a shorter time span, so adjustments by livestock managers may be more widespread and of greater magnitude.

Treatment of relatively large areas of coniferous forest around private land inholdings to protect Wildland/Urban Interface areas may encourage more livestock grazing near those private land parcels due to the transitory range that will be created and perhaps also easier access. This could lead to greater permittee/landowner conflicts, particularly when there are residences on those private parcels. Private landowners are responsible for fencing livestock out of their property in Wyoming and on the National Forest, but for a variety of reasons, some people choose not to build a livestock-proof fence. If private landowners who object to livestock on their property choose not to build fence, then they may resort to livestock harassment, which could have a negative effect upon livestock behavior and distribution within the allotment. Permittees might need to increase the amount of riding they do on the allotment to prevent or ameliorate conflicts with private landowners or negative effects to their stock.

The Modified Proposed Action will provide more wildfire suppression opportunities for fire-fighters than exist under present conditions of heavy downfall and standing dead timber. This is due to the landscape scale, high number of proposed treatment acres, and compressed time frame within which the project would be implemented relative to past vegetation treatment projects. Treatments will create more safe staging areas for fire-fighting operations after implementation; and treatments can be designed to create wide, contiguous areas of reduced fuels that may allow for wildfire containment under some conditions. As a result, some fires may not grow as large as they have in recent years. Smaller fires means reduced risk to livestock, livestock managers and structural range improvements, and fewer acres of rangeland where grazing use may need to be deferred to allow for recovery of forage plants.

Rangeland Health and Productivity

The increase in transitory range that is expected under this alternative is much larger than would occur under the proposed action. An increase in transitory range can promote better livestock distribution and therefore allow for lighter use levels on traditional primary grazing areas. This could then result in improved vigor of favored forage plants in primary grazing areas.

The modified proposed action is likely to result in many more acres of shrublands and aspen treated by prescribed fire over a shorter time period than would occur under the No Action Alternative. These treatments would convert mid or late seral stands to early seral condition in most instances and thereby create more livestock and wildlife forage. Depending on the location, site characteristics and herbaceous plant response to prescribed burning, burned areas may need to be deferred from livestock use or rested in order to allow for recovery of desirable native plant species and ground cover. Even if not all prescribed burn locations treated under the Modified Proposed Action require temporary

adjustments in livestock use in order to optimize vegetation recovery, there are still likely to be more adjustments needed overall simply due to the greater number of acres and locations treated over the life of the project. In some locations aspen suckers may be preferentially consumed by livestock or wildlife. If such use is found to occur at levels that jeopardize successful establishment of a fully stocked aspen stand and livestock are found to be the primary browsers, livestock management adjustments may have to be continued until aspen terminal buds grow beyond the reach of livestock. Rest or deferment may not be needed for treated sites normally used infrequently by livestock due to their location on the landscape relative to principal grazing areas. Any deferment or rest will require close communication and coordination with the permittee.

Conifer removal treatments that may be implemented in meadows, sagebrush parks or aspen stands under this proposal will maintain productivity of those sites for livestock and wildlife. Otherwise, as conifers increase in size and number, they shade out desirable forage plants in these locations.

As described above, the proposed action will increase firefighting options in the event of a wildfire by creating safer staging areas and larger and more contiguous zones that have reduced fuels compared to untreated areas. This could result earlier containment and smaller fires in some instances. Smaller fires means fewer acres of rangelands where forage may be consumed by fire, soil organic matter and seed banks may be destroyed, soil erosion may occur, and invasive species may invade.

Cumulative Effects

Cumulative effects consider past, present, and reasonably foreseeable activities from other action, combined with the direct and indirect effects of a proposed activity. Information from the tables in the Summary of Cumulative Effects tables was used when conducting cumulative effects analyses.

Cumulative Effects upon Livestock Producers

The Forest Service recognizes that negative effects upon livestock producers, whether from the modified proposed action or from taking no action, are cumulative to other local, national and global factors that make livestock production challenging on National Forest grazing allotments in Wyoming. Cumulative effects to producers extend outside the project area to include other federal and state lands leased by the affected permittees as well as management on their deeded ground. Some of those factors include:

- Livestock disease concerns (such as brucellosis) that affect market prices.
- Increasing prices for purchase or lease of agricultural land due to high recreational/residential values (despite the limited profitability of agriculture).
- Sharply fluctuating fuel, feed and fertilizer prices related to world oil markets, biofuel production and national trade policy.
- High cost and limited availability of labor.
- Competition from foreign markets where labor is cheaper and environmental regulations are lax.
- Cost of meeting increasing environmental regulations on private lands.
- The aging of Wyoming agricultural operators and family inheritance arrangements.
- Potential for more frequent and more severe droughts from climate change.
- Loss of livestock on National Forest allotments to predators, vehicle collisions, vandalism or theft.
- Effects of wildfire on federal (National Forest or Bureau of Land Management) grazing allotments, including temporary reductions in livestock carrying capacity while forage resources

recover and the need for cooperative investment in repair or replacement of range improvements damaged or destroyed by the fire.

- Effects of increasing recreational activity on federal lands and associated impacts such as open gates, cut fences, livestock disturbance and damage to rangelands from illegal off-road vehicular use.

Grazing permittees on National Forest lands must deal with the effects of multiple uses such as those described for this alternative and those from other user groups. Recreation, in particular, has increased steadily over time, with the motorized community increasing the most within the project area, particularly over the last 20 years. In 2006, Wyoming was reported to have the second highest OHV use rate, after Alaska, with an estimated 33.8 percent of those over 16 years of age participating (Foulke et al. 2006). OHV use that is occurring across BCH and Laramie districts affects livestock distribution and the integrity of gates and fences. Increased management effort is required of many permittees by the Forest Service to better integrate multiple uses while protecting resource values and this is reflected in the profitability of operations that include grazing allotments on National Forests. Wyoming producers who rely on federal grazing as a part of their livestock operations have been found to have a return to assets that is 23% lower than the average agricultural producer in Wyoming and 54% lower than the average agricultural producer in the nation (Moline et al. 1992).

In order to reduce negative impacts to producers within this project area, the proposed action includes design features that address potential negative impacts to producers such as coordinating treatment area locations and implementation schedules, avoidance of prescribed fire on cheatgrass prone sites, and noxious weed prevention and control measures. It also includes an Adaptive and Implementation Framework which provides an opportunity for producers and agencies such as the Conservation Districts and the Wyoming Department of Agriculture to provide input into the selection and implementation schedule of treatments, so as to reduce negative impacts.

Cumulative Effects – No Action Alternative

Past timber sales, prescribed fire in shrublands, and other vegetation treatments have created a cumulative benefit to livestock producers over the years in terms of increases in available forage for livestock and improving livestock distribution. Past timber and fuels treatments within the project area recorded in the Forest Service database of record (FACTS) encompass over 180,000 acres. However, the forage benefit of transitory range is temporary, so that the oldest forest vegetation treatments no longer provide much livestock forage. Ongoing and planned future timber treatments for the foreseeable future would total an estimated 20,000 acres, not enough to create a substantial benefit on grazing allotments across the project area, though they may benefit some permittees and improve conditions on some allotments or portions of allotments. The problems and risks associated with large expanses of standing dead and heavy downfall timber will continue to outweigh the benefits from past and future treatments under the No Action Alternative.

Cumulative Effects – Modified Proposed Action

Effects of past vegetation treatments within the project area are cumulative to the effects of the Modified Proposed Action in terms of transitory range created, timber cleared from range improvements and removal of natural barriers. Due to its scope and scale, though, the Modified Proposed Action will change post beetle epidemic conditions in coniferous forest much more than past treatments carried out from the start of the beetle epidemic to the present.

Past effects of treatments of shrublands through prescribed fire, herbicide application and wildfire are cumulative to effects from prescribed fire treatments proposed in this project. Brush Creek/Hayden and Laramie Ranger Districts conducted some relatively large scale aerial spraying of 2,4-D herbicide to kill

big sagebrush 50-60 years ago and have implemented quite a few prescribed burns on shrublands since that time. Current and foreseeable prescribed burns will treat an estimated 1,155 acres. Past treatments and wildfires have already created some diversity of age classes/seral stages in shrublands. Monitoring of shrubland sites on BCH District has shown that recovery time for treated shrublands varies greatly among sites and is influenced by the frequency of treatments, the mix of shrub species present before the treatment, grazing/browsing history, and the physical properties of the site.

The Forest Plan describes desired condition for rangelands as having 10-20% in early seral stage, 60-80% in mid seral stage, and 10-20% in late seral stage. The Forest Plan does not give guidance as to what age or canopy cover ranges are normally considered to define early, mid and late seral stages for shrublands. The Wyoming Interagency Vegetation Committee suggested that early seral Mountain Big Sagebrush (which makes up the majority of sagebrush communities on the Brush Creek/Hayden and Laramie districts) is early seral at 0-5% shrub canopy cover, mid seral at 5-20% canopy cover and late seral at greater than 20% canopy cover (Wyoming Interagency Vegetation Committee 2002). The Forest Plan directs us to analyze project level contributions to desired conditions at the geographic area scale, but the Medicine Bow-Routt NF does not have a complete inventory of the major shrubland species by seral stages. Therefore, when site specific shrubland areas are proposed for treatment during the implementation phase, fuels, wildlife, and rangeland management specialists will need to confer to examine present seral stages of shrublands from past natural mortality events, herbicide treatments, prescribed fire and wildfire in order to determine if/how proposed prescribed burn units would meet the desired seral stage distribution for shrublands in affected geographic areas. The Adaptive Implementation and Monitoring Framework included in this project provides for that coordination and review. The monitoring plan within the Framework ensures effects of shrubland treatments on desired condition are tracked and used to improve future treatment effectiveness and outcomes.

In some instances, fuels objectives may take precedence over shrubland management goals that benefit livestock and wildlife. Shrubland seral stage proportions will continue to change across the Sierra Madre and Snowy Range over the expected 15-year life of this project from a combination of implementation of shrubland management projects already approved but not yet implemented, wildfire, natural succession, and the effects of insects, disease, drought and other natural events. With the Adaptive and Monitoring Framework included as part of this project, which provides for multidisciplinary input on design of specific treatments, there should be a positive cumulative effect on shrubland health and diversity unless noxious weeds and other invasive plant species increase significantly (see the Noxious and Invasive Plants Report for this project).

Negative effects of the Modified Proposed Action on livestock management (disturbance to livestock, higher traffic on allotment roads, and temporary damage to fences during harvest operations) are largely short-lived and are offset by positive effects such as an increase in transitory range, improved and safer access, and reduction of damage to some fences and other range improvements from falling trees. For this reason, the project is not expected to add appreciably to the other factors that cumulatively negatively impact livestock management for the affected producers or rangeland health and productivity within the grazing allotments in project area.

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